



# Crewman's Associate Advanced Technology Demonstrator Briefing

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# TARDEC Crew Reduction Efforts

Evolving Knowledge and  
Technology “Baseline”

FY93

Crewman's  
Associate  
Simulation



FY96

System Integration  
(Lab)



FY98

Vehicle  
Tech Demo #1  
(VTT)



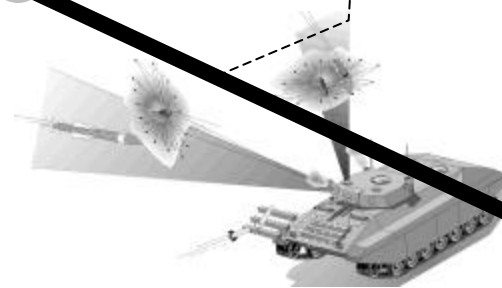
FY00

Vehicle  
Tech Demo #2  
(CAT ATD)



FY04

Two Man  
Transition  
Future Combat  
System



FY06

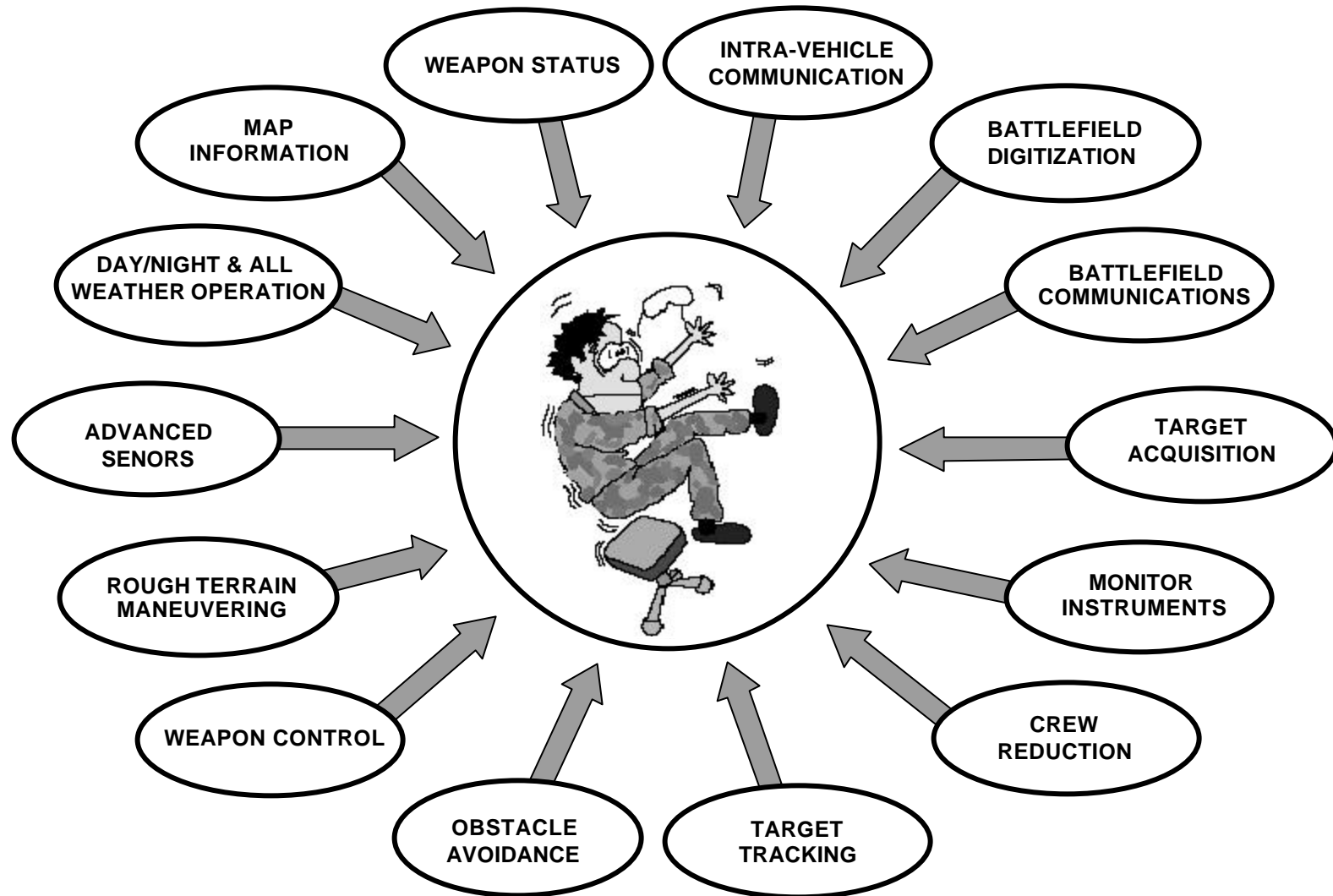
Baseline  
Developed



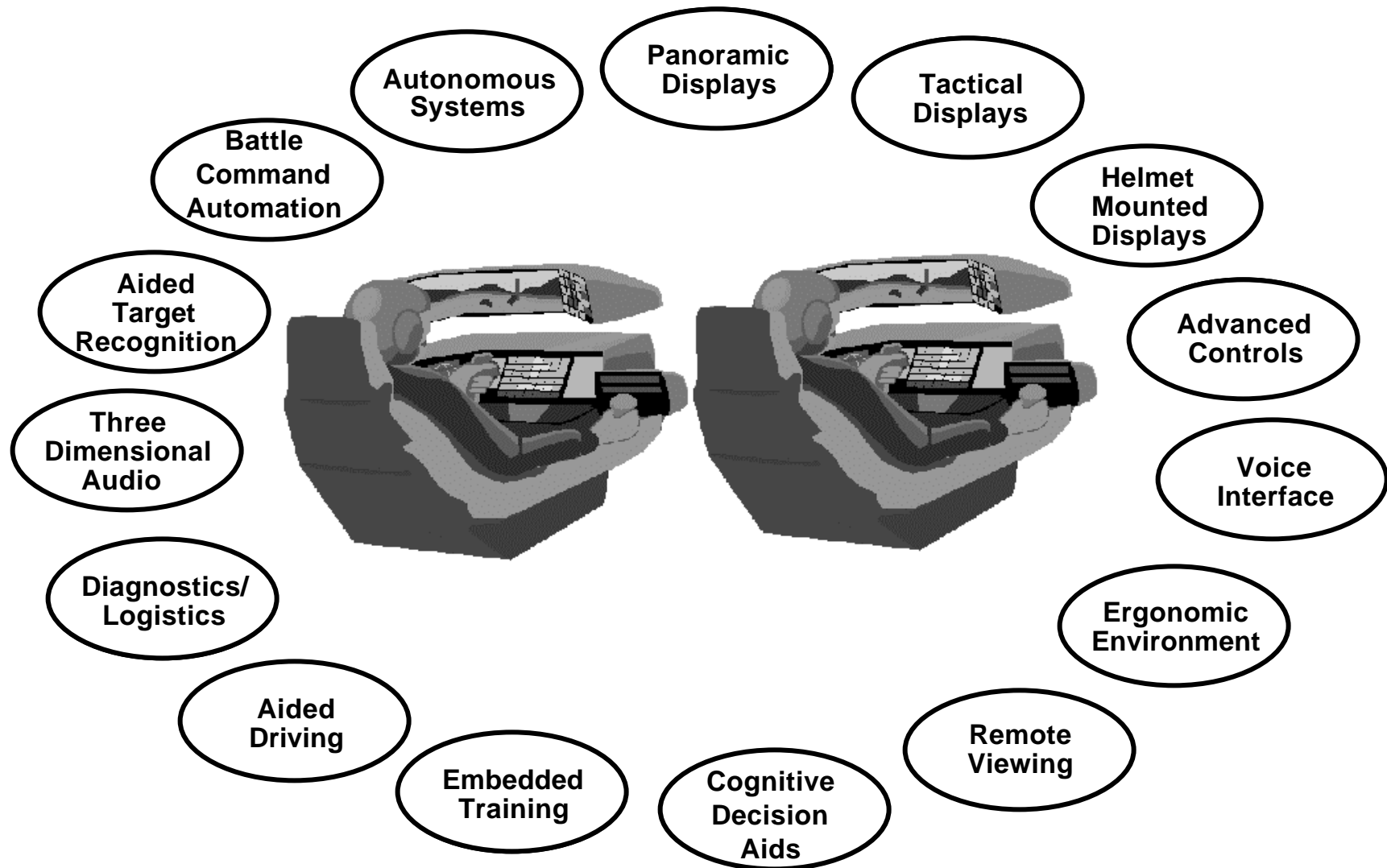
# Crewman's Associate ATD

- The development of a crew station soldier-machine interface
- The integration of advanced technologies, such as aided target acquisition, integrated defense, combat ID, digital messaging, driver's aids, etc.
- Two platforms (time frames) addressed:
  - Potential M1A2 (SEP) + (1998 *technology*)
  - Future MBT (2005 *technology*)

# Motivation



# Vision

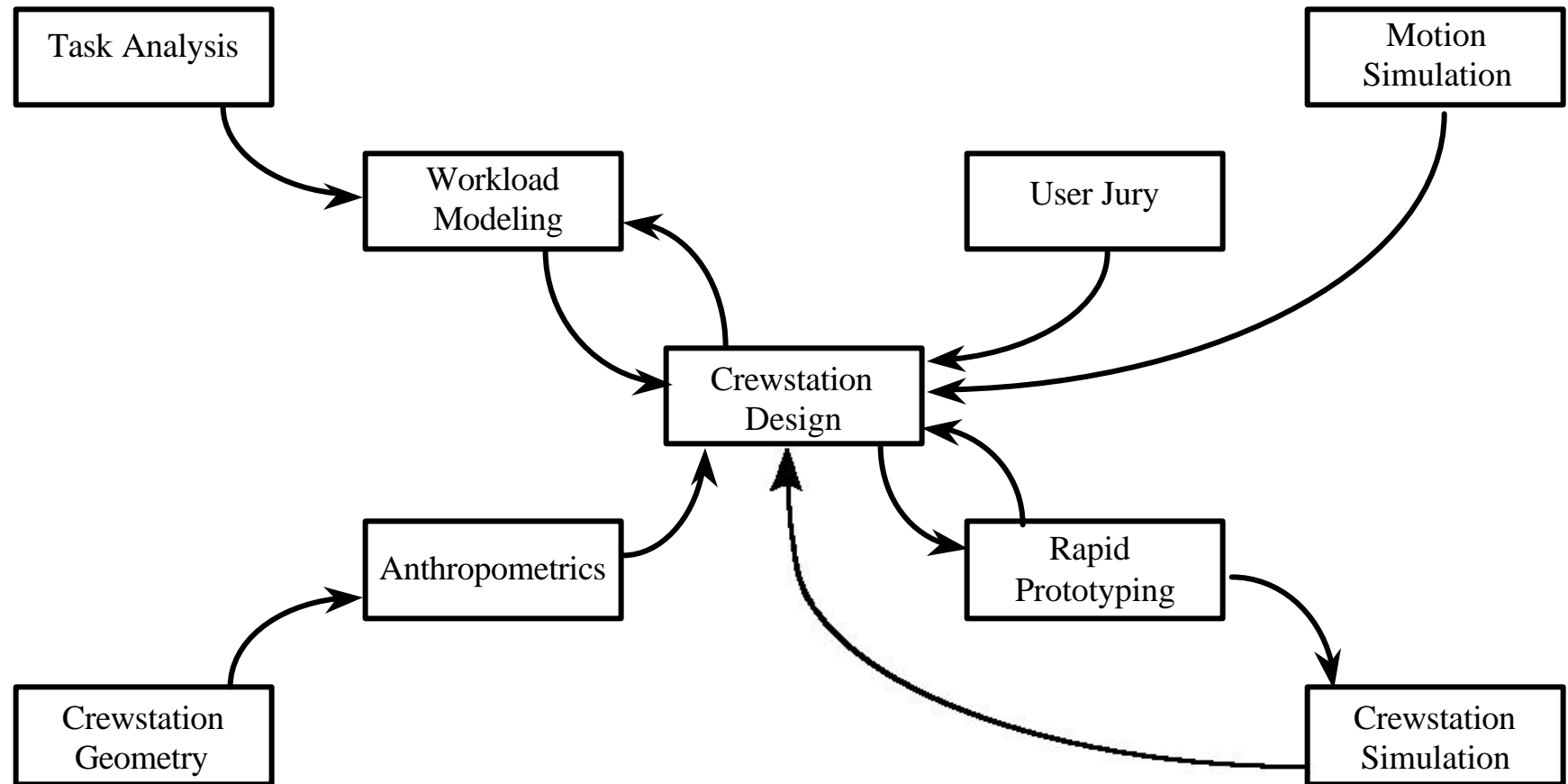


# *Objectives*

Increase Main Battle Tank operational effectiveness by:

- Decreasing engagement timelines
- Decreasing time required to create and send digital C2 reports
- Improving operations on the move
- Improving situational awareness
- Improving night operations
- Providing a User-friendly interface to the digital battlefield of Force XXI
- Improving CONOPs
- Reducing maneuver damage

# *CTT Design Methodology*



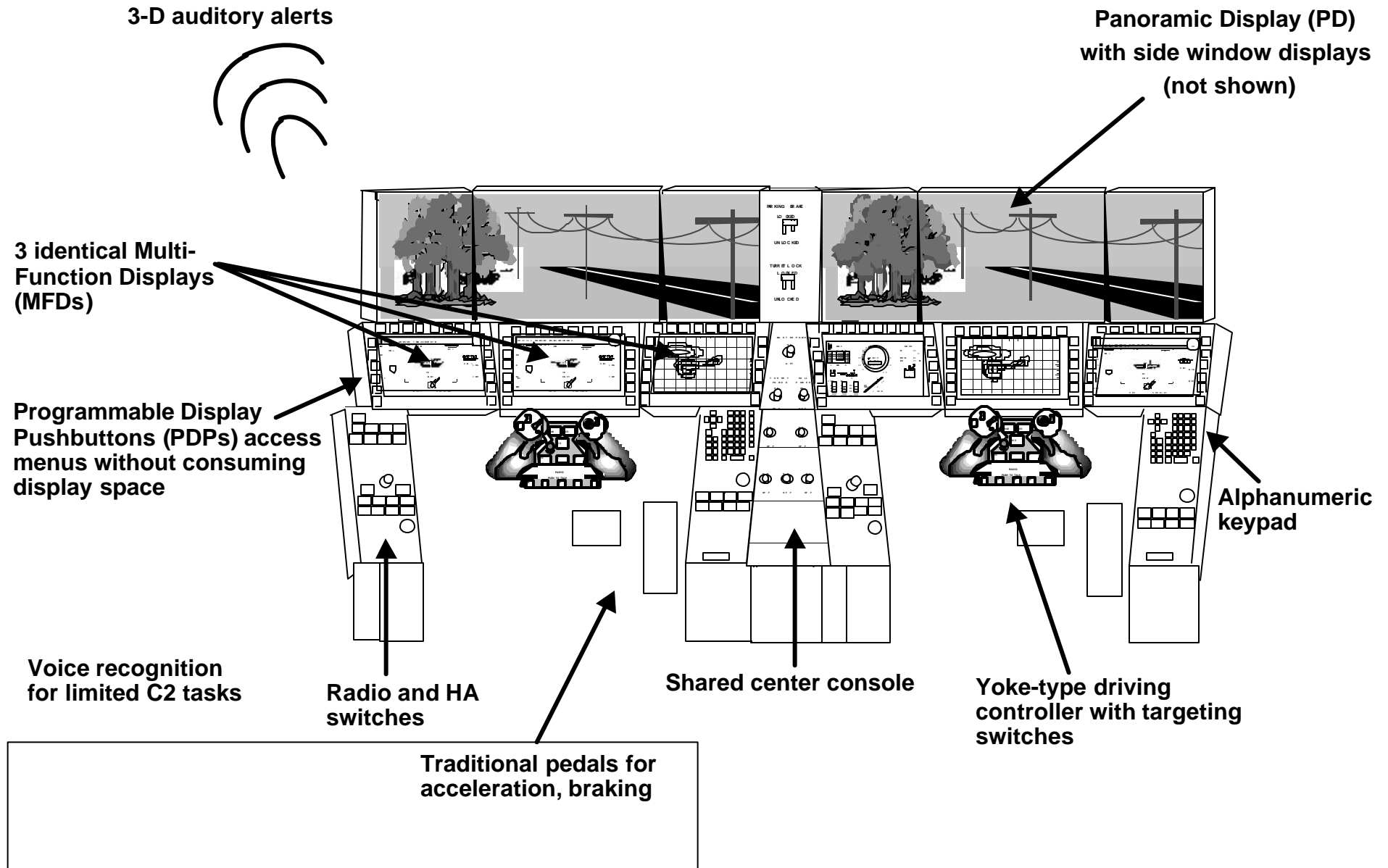
*Individual Steps or Complete Design Process Performed to Meet Project Goals*



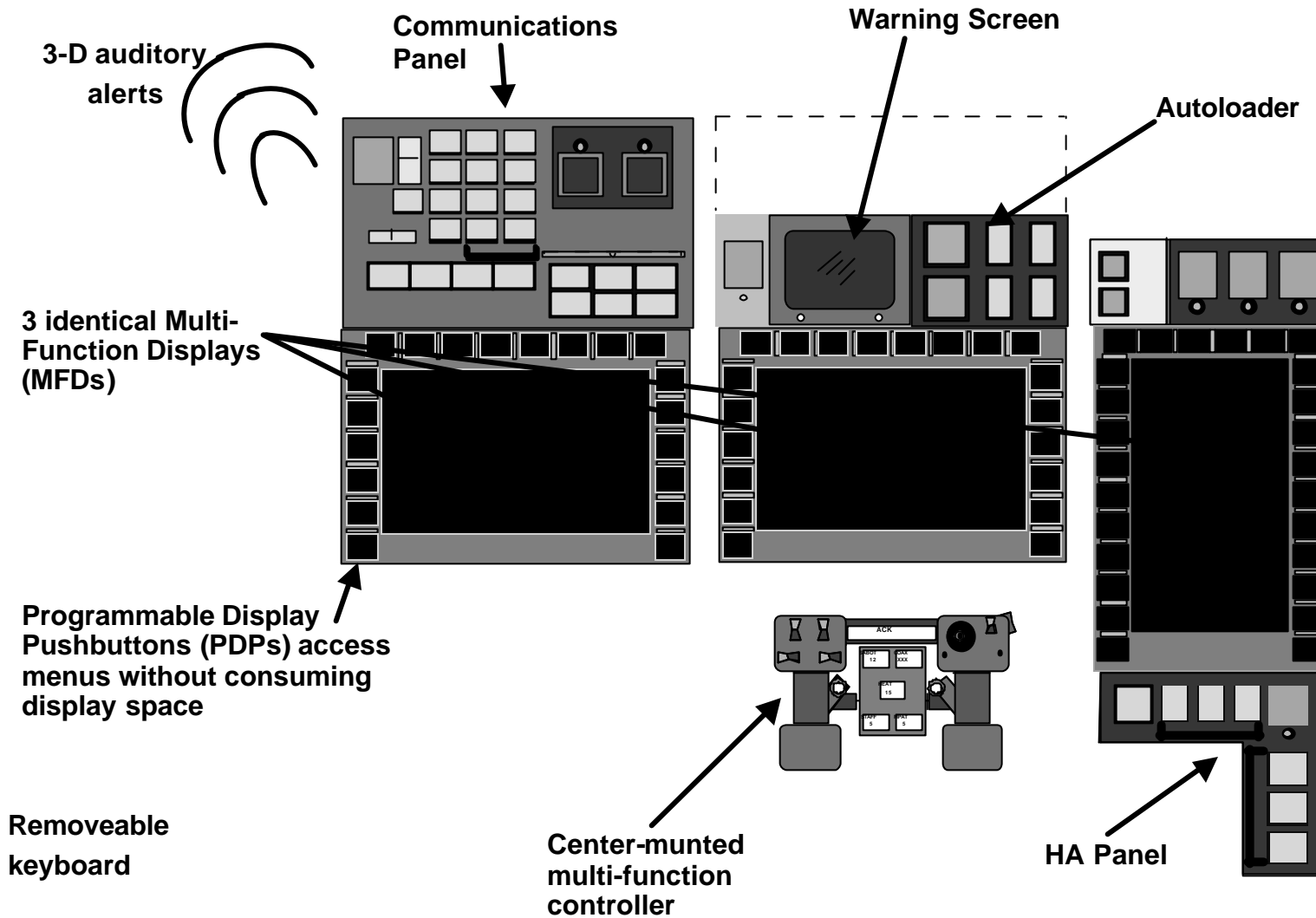
# **Crewstation Design Principles (Primary)**

- Hands on primary controller
- All critical information in the primary vision zone
- One step functions
- Consistent Mental Model

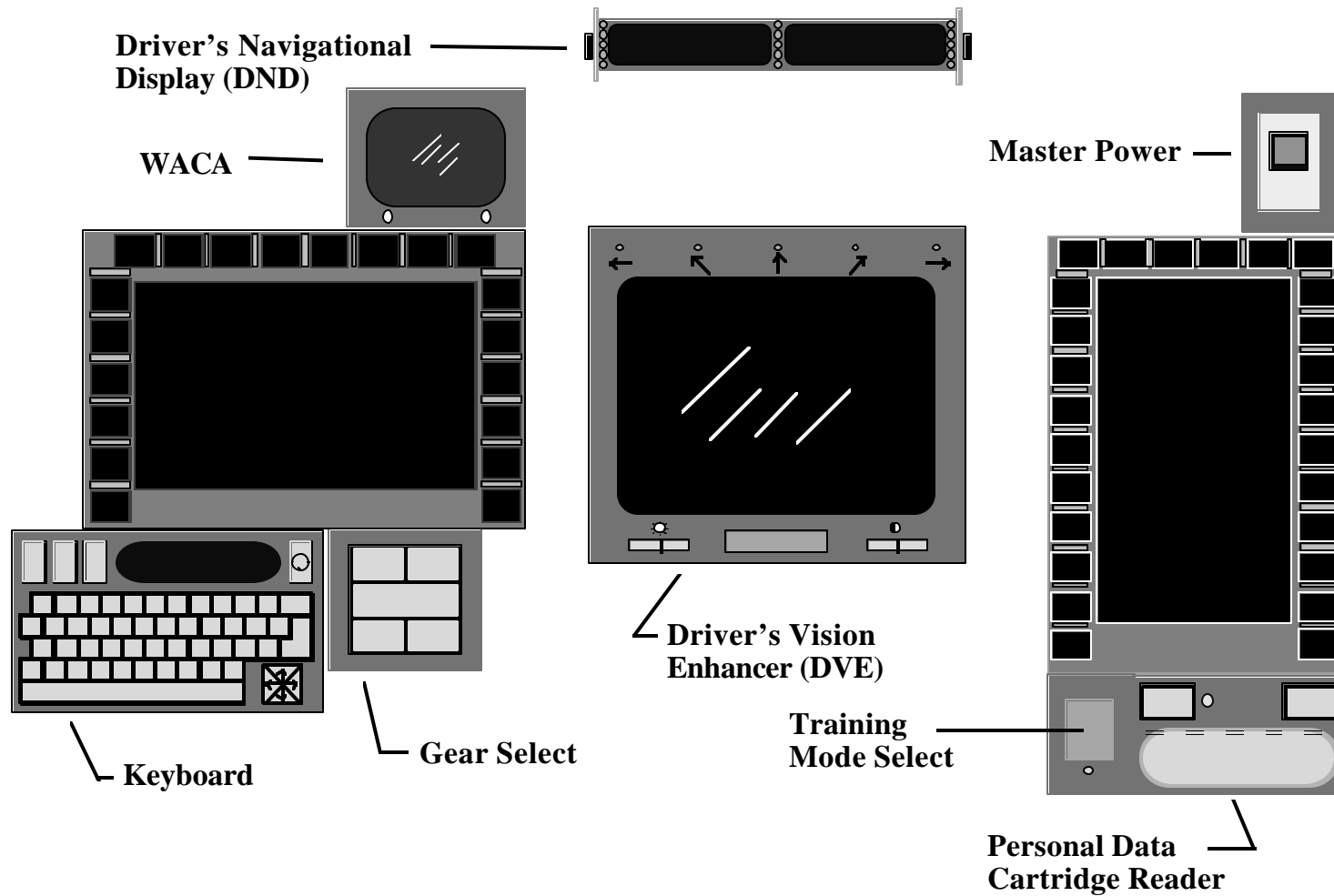
# 2005 Crewstation



# *1998 Crewstation*



# *1998 Driving Station*



# Crewstation Displays

## Panoramic Display

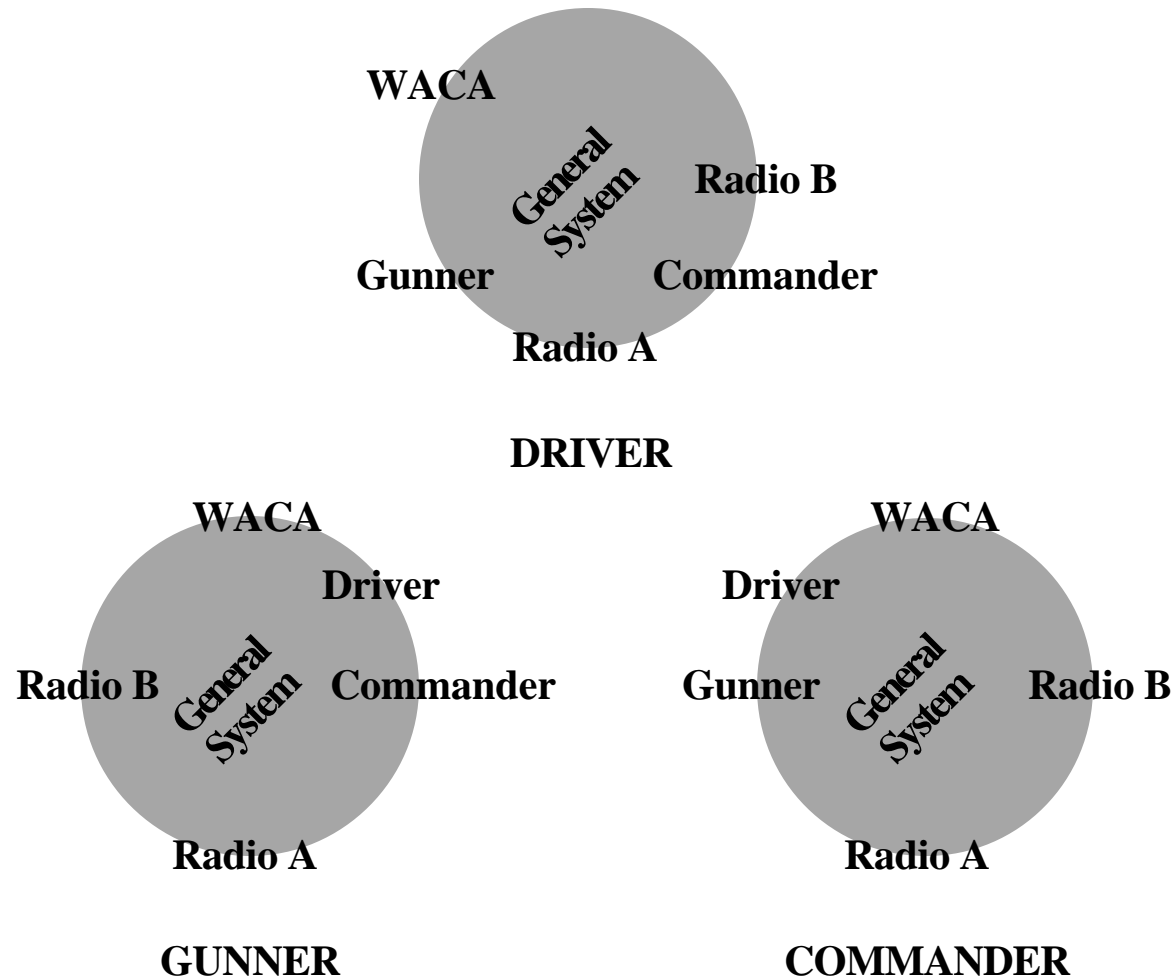
- 180 degree indirect vision to the crew
- Inherent protection from directed energy weapons
- Seamless, closed hatch vision
- Common visual environment
- Located within the Primary Vision Zone.

# Crewstation Displays

## Multifunction Displays

- Display information from different subsystems: targeting, driving, command and control, tactical map, etc.
- Buttons on the top of the MFD select the displays functionality.
- Located within the Primary Vision Zone.
- Provide consistent mental model.

# 3D Audio Display





- A User-friendly interface to the digital battlefield of Force XXI
- A 65% decrease in the workload required to send C2 messages
- Improved situational awareness
- Improved operations on the move
- Improved night operations
- Reduced maneuver damage
- Improved CONOPs



# **Test Results**

## **(Non-experimental analysis)**

- Operations on the move have been improved due to:
  - 1) decreased steps required to execute tasks
  - 2) elimination of dragging the cursor
  - 3) all critical task on yoke
  
- The crewmen now have a simplified, User-friendly interface to the digitized battlefield of Force XXI.
  
- The ability to effectively perform continuous operations has been improved due to the decreased fatigue associated with operating this crew station.

# Test Results

## (Subjective Comments)

- The electronic map provided the most significant performance enhancement
- The ability for each crewman to tailor his individual displays to suit his preferences was helpful
- Digital C2 interface had a positive impact on performance, being easier and faster than M1A2
- Aided target acquisition had a positive impact on performance.
- *Combined interfaces and technologies provided the ability to rapidly convey the information required to control forces at the platoon and company level*

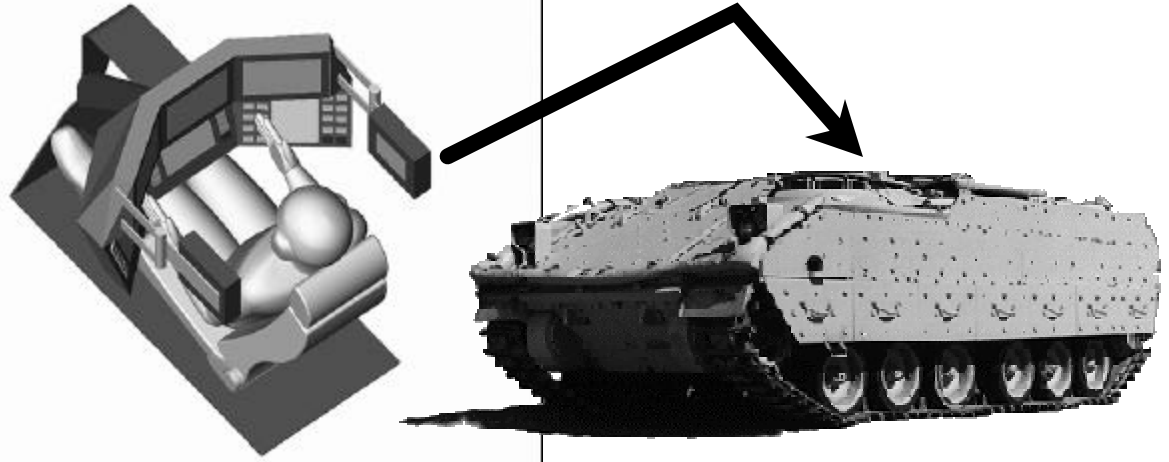
# Vetronics Technology Testbed (VTT)

- **Update Crewman's Associate Crew Station Design**

- Lessons Learned
- Technology Advances
- Test Bed Costs
- Test Bed Space

- **Integrate into Bradley A0 Hull**

- Two Crew Stations
- Supporting Technology
- Supporting Subsystems



- **Conduct Test Bed Workload Experiments and Technology Demonstrations in the Field**

- Side-By-Side
- In-Line

